AGRICULTURAL HEALTH AND SAFETY

Initial Statement - Nationally, agricultural health and safety issues include ergonomics and musculoskeletal disorders, the application of engineering solutions to respiratory disease prevention, building surveillance capabilities, agricultural infectious diseases, and the need for better awareness of agricultural health risks among doctors and nurses. Additionally, it involves working directly with farmers, ranchers, and the agricultural community to pursue disease and injury prevention ⁹⁴.

Section Five was largely developed through the input and information contributed From University of Iowa - Iowa's Center for Agricultural Safety and Health (I-CASH)

The US Bureau of Labor Statistics (BLS) recently released their count of agricultural work deaths for 2009, an accumulation of Census of Fatal Occupational Injury (CFOI) numbers from all states. The BLS CFOI sum for "Agriculture" deaths in a central U.S.A nine state region (ND, SD, NE, KS, MO, IA, MN, WI, IL) for the 3- year period is 571. Important when comparing the national total is more die working in "Agriculture" in the central USA region, about 30 percent of the total for the nation! Over the period, 60 percent involved tractors or other mobile machines, 9 percent occurred with grain or feed storage and handling, were caused by livestock, and the remainder were a mixed bunch ⁹⁵.

In lowa the rural population suffers from excessive injuries and illnesses, yet there are insufficient health and preventive services to properly address the issue. The rural population can be divided into rural farm and rural non-farm sectors. There are about equal numbers in each sector. The farm sector has a unique set of occupational health and safety issues in addition to sharing the health and safety issues of the general rural population. The general health care and public health infrastructure is insufficiently equipped to deal with the identification, treatment, and prevention of agricultural occupational health and safety issues. This chapter will define those health and safety issues that are related to agriculture and suggest goals and methods to attack these issues.

Rural Agricultural Demographics

The rural population (those living outside a city of greater than 2500 persons) comprises about 43.3 percent of the total of lowa's three million inhabitants. Of the rural population, about 20% are involved in production agriculture, which includes owner operators, family members, or employed farm workers (approximately 280,000 persons) ⁹⁶.

About 90 percent of the land mass in Iowa is in production agriculture. Iowa is the second leading state in total sales of agricultural products, second only to California (a state 3 times the size of Iowa) ⁹⁷. The total sales of agricultural products amount to about \$26.3 billion annually, about 6.5 percent of Iowa's GDP, and has grown about 17 percent annually over the decade ⁹⁸.

There are 92,856 farms in Iowa (3rd in the U.S), rather equally spread across the entire state. On these farms are raised about 26 million pigs annually ⁹⁸. In 2009, 2.5 billion bushels of corn was raised on 13.4 million acres, and 504 million bushels of soybeans on 9.7 million acres ⁹⁹. Further, there are 40 million laying hens producing 9.5 billion eggs per year ¹⁰⁰. Compared to other states, Iowa is the number one leading state in production of pork, corn, soybeans, and eggs. Iowa is also prominent in production of beef on feed (5th), sheep and lambs (8th), turkeys (10th), and milk (12th).

In lowa farms can be classified into three groups, based on management and production type. The first are traditional family farms which make up by far the highest percentage (83.4 percent) of farm type and the highest number of persons engaged relative to the other two types.

Figure 1.



The second farm type is large, more corporate-style farms. These are characterized by a separation of management and labor, specialization and concentration of production type (only grain, or pork, or eggs, etc) and large production volume. The third type of farm is alternative or niche farms. These farms are often family run with perhaps only a few local seasonal employees producing a variety of products mainly for the local markets (e.g. fruits and vegetables for famers markets, community supported agriculture, organic production). The family farms (often referred to as the farms in the middle) are decreasing in number relative to the growing number of the larger corporate style farms and the growing number of alternative farms. The

reasons for this trend largely depend on economic forces primarily related to our global economy. The cost of production has continued to rise relative to income from commodities requiring greater production and efficiency. It is often difficult for many family farms to have the capitalization to add land, equipment, facilities and labor to achieve the economy of scale where net income is sufficient for a suitable family income without additional off-farm employment. Either one or both spouses on about 60 percent of family and niche farms have additional employment off the farm. Even with these challenges, the total number of farms has increased from about 90,000 in 2002 to 92,856 *in the 2007 census*. (Most of the 2000 added farms over the period are niche or alternative agricultural operations).

Producers/Families/Workers

As mentioned (although under stress) the family farm is still the backbone of Iowa agriculture, making up the greatest proportion of persons involved in Iowa agriculture, with about 85,000 family farms (of the total 92,000 farms), with 85,000 owner/operators, about 170,000 family members and 20,000 employees or a total of about 275,000 persons. Employed farm workers can be categorized in two groups: 1) native citizens (usually indigenous local Caucasians) and 2) foreign born workers (mostly Latino's, non-citizens, and an estimated 30 percent undocumented workers). There are an estimated 17,000 of the former and 3,000 of the latter.

General Health Status of the farm population

The good news about the farm population is that by some measures, they appear healthier than the general population as noted by the fact that their fatality rates are lower for the principal causes of death compared to the general population. They have lower rates of fatalities due to heart attacks, stroke, and overall cancer. The principal explanation for these observations seems to be associated with lower incidence of cigarette smoking. By several measures in lowa, only about 5 percent of the farm population smoke compared to about 22 percent of the general population ¹⁰¹. Additionally, there is some evidence that more healthy diets and more exercise also contribute to these findings.

The immigrant worker population on the other hand does not appear generally as healthy as our indigenous farmers and farm workers. The following table 1 summarizes common health conditions of the immigrant worker population.

Table 1.

Migrant Health Problems	Data: Proteus, by Antonio Heras
Occupational Exposures	Lifestyle Exposures
Unintentional injuries	Oral health problems
Pesticide exposure	Infectious diseases (TB, HIV, STDs)
Skin diseases	Mental health problems
Eye injuries	Substance abuse
Respiratory disease	Chronic diseases
	Nutrition deficiencies

General Occupational Health Issues

The overarching problem with the health status of the farm population is the occupational injuries and illnesses they suffer. Approximately 550 farmers in the U.S. die annually from occupational injuries. In Iowa, approximately 30 farmers lose their lives from occupational injuries. Agriculture is the most hazardous occupation in the U.S., as well as in Iowa, with an occupational fatality rate 6 times higher than the general working population. In Iowa, farmers make up about 37 percent of all occupational fatalities in the state ¹⁰², even though they only comprise 7 percent of the total workforce (farm workforce here does not include family member.)

Fatalities from trauma

The primary agent associated with occupational fatalities is farm machinery. Within that category, tractors are by far the principle agent of fatalities, associated with nearly 50 percent of all occupational fatalities. Of the tractor associated fatalities, 50 percent of those are due to tractor overturns, crushing the operator. Nearly 100 percent of those crushing injuries are associated with older tractors that do not have roll over protective structures (ROPS). An additional 25 percent are from run overs, and 25 percent associated with roadway collisions. Other fatal injuries are distributed over a variety of causes including other types of machinery, all-terrain vehicles, animal injuries, confined space hazards including flowing grain entrapments, and hydrogen sulfide poisoning from liquid manure storage in swine or cattle confinement operations. Among a variety of other fatal exposures, farmers also die more frequently than the general population as a result of suicides. The mode of doing farm work is

changing as farmers and farm youth move from tractors to all-terrain motor vehicles (ATV) to transport equipment, and to move across the fields. Unfortunately, as ATV use increases so do accidents and death rates. There are currently programs and projects focused on ATV safety for youth. The University of Iowa Children's Hospital is one of the state leaders for ATV safety. Nationally, there are over 200,000 ATV accidents per year; **in Iowa** one in three ATV accidents involves children under age 16. Most pediatric safety experts strongly discourage ATV ridership by children under age 16 and promote use of safety helmets.

Fatalities from acute illnesses

Acute occupational fatalities in farmers from pesticide poisonings are very rare today as a result of less acutely toxic chemicals used today, safer formulations, and safer application methods. However, we have seen a rash of fatalities in crop dusters these past few years as a result of plane crashes.

Although overall cancer fatalities are reduced in the farming population (as a result in lower smoking related cancers, e.g. lung cancer), farmers are at increased risk for several different cancers, including multiple myeloma, non-Hodgkin's lymphoma, prostate cancer, and brain cancer among others. The causes of these increased cancers are not entirely clear, but there have been shown associations (not cause/effect in most cases) with chemicals such as pesticides (e.g. the herbicides 2, 4-D and 2, 4, 5-T with non-Hodgkin's lymphoma and soft tissue sarcoma) and nitrates in the water.

Chronic illnesses

There are numerous occupational illnesses that may not result in acute fatalities, but may result in significant disabilities. Respiratory problems lead to illness conditions with about 17 percent of grain farmers and 25 percent of pork producers suffering one or more respiratory conditions ¹⁰³. Skin conditions, toxicity conditions, infections from livestock, hearing loss, arthritis, and behavioral health issues including psychological stress and depression are common (Lessenger, 2006) ¹⁰⁴. The average farmer works in the midst of a host of occupational hazards, while struggling with the stress of trying to beat nature's weather and volatile commodity markets with an aging body and associated cumulative physical stress resulting in arthritis, low back pain, and hearing loss. Special understanding and services are needed to care for this sector of the rural population.

Although agricultural fatalities in Iowa have declined over the years, agriculture is still by far the most hazardous industry in which to work. Besides the social and psychological trauma these fatalities and injuries take on our fellow Iowans, there are severe economic concerns as well. As agriculture is such a fundamental industry in our state, the injuries and fatalities make a big impact on the state's economy as each fatality costs \$442,769 ¹⁰⁵. For the approximately 30

fatalities we have experienced in Iowa in recent years, this would add up to \$16,364,670 annually. Studies have shown that a typical producer (and/or his/her insurer) spends about \$512 annually on illnesses and injuries as a result of their work exposures. Multiplying this by our 92,000 farms, results in an estimated \$47.5 million expense. When combined with the expense of fatalities, Iowans experience a \$63.8 million annual loss in medical expenses and labor loss annually resulting from agricultural injuries ¹⁰⁶.

General rural health care insufficient

lowa is similar to many rural states in that we are challenged by the lack of ability to provide sufficient, accessible, and affordable health care to our rural communities. Other sections of this report clearly identify these needs. Even if general health care were sufficient in our state, the unique health issues of our agricultural population would not be well served. Awareness, understanding, and ability to identify, treat and prevent agricultural occupational problems are not available in our general rural health care system. There has been an emerging specialty in the field of rural primary health care and occupational health, called "agricultural medicine". Without this type of specialty care, the overall health of our rural population will continue to lag behind.

Provisions to care for the occupational health care of the agricultural population

The general training of our health care providers does not include enough training in agricultural medicine (Agricultural Medicine is the science of identifying, treating and preventing injuries and illnesses in agriculture) (Donham 1983). In our experience occupational related illnesses may not be diagnosed or treated correctly by health care providers if they are not trained in agricultural medicine. Also, injuries may not be properly treated or prevented. The general health care community is not sufficiently equipped or educated to handle these issues.

Agricultural occupational health and safety services available

The Extension Service of Land Grant Colleges typically has had one Agricultural Safety Extension Specialist (regardless of the size of the agricultural population within the state). However, budgets have been trimmed progressively over the years and many states no longer have such a position. Although Iowa still has such a position, it is not a full time position and the service is limited to education and information dissemination to the agricultural population, dealing mainly with acute injuries.

To help address the broader issues of occupational health in agriculture, Iowa's Center for Agricultural Safety and Health (I-CASH) was established by an act of the Iowa Legislature in 1990. I-CASH is housed at the University of Iowa, but is a consortium of the University of Iowa

College of Public Health, Iowa State University, The Iowa Department of Public Health, and the Iowa Department of Agriculture and Land Stewardship. Further, it serves as a convening organization for several agricultural health non-profit organizations in the state, including The AgriSafe Network, Farm Safety 4 Just Kids, AgriWellness, Proteus, and the National Education Center for Agricultural Safety. Activities are coordinated to support one another in the most efficient and effective manner possible.

Training of health care providers in Agricultural Medicine

One of the principle missions of I-CASH is to increase the awareness and knowledge of our health care practitioners about the illnesses and injuries associated with lowa's agriculture, how to treat them and how to prevent them (Agricultural Medicine). In the mid and late 1970's, I-CASH started as a small program at the University of Iowa to train medical students in this capacity. Over the years, it has grown to include training of physician assistants, and doctors being trained in family medicine in the 10 family medicine residency training programs scattered about the state. To support the mission three graduate programs in agricultural health and safety were established; 1) a graduate certificate, 2) a Master of Science, and 3) a PhD program. Additionally, a continuing education program for practicing physicians was developed. The course, held annually in June attracts around 40 health professionals. To date, over 300 lowa health professionals have been trained in Agricultural Medicine.

In 1987, a program to provide agricultural occupational health services to the agricultural community was started. It is now called the AgriSafe Network. In lowa, there are 13 communities that have an AgriSafe clinic. Most of these clinics are associated with rural hospitals, but some are associated with county health departments. These clinics are typically run by nurses trained in agricultural medicine at the University of Iowa. The AgriSafe clinics provide injury and illness prevention assessment and detection for farm families. This model seems to be the perfect reflection of current health reform direction that is directing prevention programs at the local level and in conjunction with medicine and public health. See Figure 2 on the next page.

Summary statement - If the community based system can grow and obtain adequate funding, a large step toward providing agricultural medicine services (the missing component of our rural health care system) will have been addressed.

Figure 2.



Comments (From the Iowa's Center for Agricultural Safety and Health Program)

Future goals for agricultural health and safety are embodied in the updated goals and objectives of the 2010 Healthy Iowan's document, which listed specific needs and recommendations for Agricultural Occupational Health – Chapter 14 goals statement, 14. 2.

These goals and objectives are modified and updated below to reflect the needs for the decade of 2010 – 2020. Although these goals and statements are reviewed and revised for Healthy lowan's 2020 report, the statements below are very relevant for this report.

The following are recommendations for 2020

- 1) Decrease occupational fatal and nonfatal injuries in agricultural populations as follows:
 - Decrease by 25% overall fatal and nonfatal injuries in the farm population
 - Baseline, 2010: 840 fatal and nonfatal injuries, including 30 fatalities (Iowa Department of Public Health and Iowa State University Extension)
 - Decrease by 50% occupational related fatal injuries in farm youth.
 - Baseline, 2010: 6 fatalities among children aged 18 and under (Iowa Department of Public Health and Iowa State University Extension).
- 2) Certify 2,000 Iowa farms in the Certified Safe Farm program to generally reduce hazardous exposures on farms.
 - o Baseline, 2010: 600 farms (Certified Safe Farm program).
- 3) Increase health and safety education for farm youth by expanding the Farm Safety 4 Just Kids chapter network to 30 chapters.
 - Baseline 2010: 17 chapters.

- 4) Through 2020, increase hands-on training for farmers, agricultural safety educators, and emergency medical personnel as follows:
 - Annually train 2,000 firefighters and emergency medical services personnel on agricultural trauma and/or rescue;
 - Annually train 2,500 lowa teens aged 14 to 15 on tractor safety; and
 - Annually train 50 high school vocational agriculture teachers in tractor safety.
- 5) Through 2020, enhance federally funded programs on agricultural health and safety, such as the Great Plains Center for Agricultural Health and the Fatality Assessment and Control Evaluation program. (A University of Iowa and Iowa Department of Public Health)
- 6) Through 2020, continue planning and coordination among the agencies to provide public service announcements and other community information on farm health and safety that is also culturally sensitive and language appropriate.
- 7) Through 2020, continue to enhance relevant web sites to increase access to knowledge of agricultural health and safety.
- 8) Through 2020, continue efforts to reduce tractor- related injuries by 50%. Actions to attain this goal should include endorsement, promotion, and enactment of the educational, incentive-based and regulatory aspects of "Tractor Risk Abatement and Control including:
 - a. The Iowa Department of Public Health should monitor tractor injuries
 - b. The Iowa Department of Transportation should promote lighting and marking standards for tractors on the roadway
 - c. The Iowa Department of Education and the Iowa Department of Transportation should assure that schools include tractor safety and roadway safety (regarding driving with tractors and other farm equipment on roads) in driver's education courses
 - d. The Iowa Department of Transportation should assure that driver's training and driver's license tests include questions on safe operation of vehicles on roadways where farm machinery operates; and the Iowa legislature should enact model legislation listed elsewhere in this plan.
 - Baseline: Average annual tractor-related fatalities totaled 22 from 1990 to 1997; it is estimated that successful implementation of these measures will reduce annual lowa tractor-related fatalities to no more than an average of 11 by 2020.
- 9) Provide health care resources to the immigrant farm worker community in Iowa.
- 10) Increase the number and distribution of AgriSafe Clinics in the state so that all farmers would be within 50 miles of such a clinic. To achieve this goal, we would need to achieve I-CASH funding levels to its original legislated intent of \$360,000, (adjusted to 2011 dollars, which would be \$609,000).
 - o Baseline: in 2010 there are 13 AgriSafe Clinics in Iowa.